MASTER OF SCIENCE
IN
INFORMATION SYSTEMS AND OPERATIONS

LINK LAYER AND NETWORK LAYER PERFORMANCE OF AN EXPERIMENTAL UNDERSEA ACOUSTIC NETWORK

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This thesis is an analysis of the link-layer and network-layer performance of an experimental Seaweb undersea acoustic network. The objective is to statistically determine RTS/CTS handshaking and ARQ retransmission performance during the Fleet Battle Experiment-India, executed in June 2001. Many factors constrain or impair undersea acoustic communications. Analysis of a sample portion of the data reveals insights about the overall throughput, latency, and reliability of the Seaweb network.

KEYWORDS: Link Layer, Network Layer, Undersea Acoustics, Seaweb

OPERATIONAL BENEFIT OF IMPLEMENTING VOICE OVER INTERNET PROTOCOL IN A TACTICAL ENVIRONMENT

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In this thesis, Voice over Internet Protocol (VoIP) technology is explored and a recommendation of the operational benefit of VoIP is provided. A network model is used to demonstrate improvement of voice End-to-End delay by implementing quality of service (QoS) controls. An overview of VoIP requirements is covered and recommended standards are reviewed. A clear definition of a Battle Group is presented and an overview of current analog RF voice technology is explained. A comparison of RF voice technology and VoIP is modeled using OPNET Modeler 9.0.

KEYWORDS: Voice over Internet Protocol, VoIP, ADNS, Quality of Service, QoS